

-7-

Remarks

This application has been reviewed in light of the Nonfinal Office Action of November 13, 2007. Claims 1-7, 9-11, and 13-17 are pending, and all claims are rejected. In this paper, claims 1, 9, and 13 are amended; new claims 18-21 are added; and the following remarks are submitted. Reconsideration of the application is respectfully requested.

Applicant incorporates the discussion of legal requirements found in the prior responses, in the Appeal Brief, and in the Reply brief.

**Ground 1.** Claims 13-17 are rejected under 35 USC 103 over Subramanian U.S. 6,296,945 in view of Stoffer U.S. 5,932,083. Applicant traverses this ground of rejection.

The following principle of law applies to all sec. 103 rejections. MPEP 2143.03 provides "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art references clearly do not arguably teach some limitations of the claims.

Amended claim 13 recites in part:

"...the primary ceramic coating has an excess of oxygen vacancies therein,"

Neither reference has such a teaching. There is no mention of excess oxygen vacancies in either reference.

-8-

Claim 13 further recites in part:

"a sintering-inhibitor region at a surface of the primary ceramic coating, wherein the sintering-inhibitor region comprises cerium oxide with cerium in an oxidation state that removes oxygen vacancies from the primary ceramic coating" [emphasis added]

Neither reference has such a teaching. There is no mention of cerium in an oxidation state that removes oxygen vacancies from the primary ceramic coating in either reference.

**Ground 2.** Claims 1-5, 7, 9, 10, and 13-17 are rejected under 35 USC 103 over Villiger U.S. 2001/003631 in view of Vine U.S. 4,861,618 and Liu publication. Applicant traverses this ground of rejection.

Claim 1 recites in part:

"a surface of the primary ceramic coating comprises columnar grains having facing surfaces"

Villiger teaches a porous ceramic material (Abstract, lines 1-3). There is no mention of a columnar grain structure in the ceramic material. Vine and Liu have no teaching of the microstructure of the primary ceramic coating.

Claim 1 further recites in part:

"heating the cerium-oxide-precursor compound...leaving air-filled gaps between the facing surfaces of the columnar grains"

Villiger teaches that the pores are completely filled with the infiltrated material, see Figure 1, thereby sealing the surface of the ceramic. Vine and Liu have no teaching on this subject.

Claim 9 recites in part:

"depositing a yttria-stabilized zirconia primary ceramic coating in a columnar form onto the exposed surface of the bond coat"

Villiger teaches away from this limitation, by teaching the use of the porous ceramic material. Vine and Liu have no teaching on this subject.

Claim 13 recites in part:

"a primary ceramic coating on the exposed surface of the bond coat, wherein a surface of the primary ceramic coating comprises columnar grains with facing surfaces"

Villiger teaches away from this limitation, by teaching the use of the porous ceramic material. Vine and Liu have no teaching on this subject.

Claim 13 further recites in part:

"wherein the primary ceramic coating has an excess of oxygen vacancies therein"

None of the references have any teaching on the subject of oxygen vacancies.

Claim 13 further recites in part:

"a sintering-inhibitor region at a surface of the primary ceramic coating, wherein the sintering-inhibitor region comprises cerium oxide with cerium in an oxidation state that removes oxygen vacancies from the primary ceramic coating" [emphasis added]

None of the references have any teaching on the subject of cerium in an oxygen state that removes oxygen vacancies.

-10-

Each of claims 2-5, 7, 10 and 14-17 also stand rejected under Ground 2, all of which depend from claims 1, 9 or 13. Thus, for at least the same reasons discussed above that claims 1, 9 or 13 are not rendered obvious by Villager in view of Liu and Pine as discussed above, all of claims 2-5, 7, 10 and 14-17 are also not rendered obvious and are also in condition for allowance.

**Ground 3.** Claims 6 and 11 are rejected under 35 USC 103 as unpatentable over Villager in view of Vine and Liu, and further in view of Ueda U.S. 5,697,992. Applicant traverses this ground of rejection.

Ueda is nonanalogous art. Stated alternatively, Ueda is not within the scope and content of the prior art that may be used in forming a sec. 103 rejection. Its teachings are therefore not properly combined with the teachings of the other three references. To be analogous art and properly used in forming a sec. 103 rejection, a reference must be concerned with the same problem as another reference and the claims which are being addressed. See, for example, Medtronic, Inc. v. Cardiac Pacemaker, Inc., 220 USPQ 97, 104 (Fed. Cir. 1983), stating: "Faced with a rate-limiting problem, one of ordinary skill in the art would look to the solutions of others faced with rate-limiting problems."

In the present case, the inventors were concerned with thermal barrier coatings such as those applied to turbine blades and other structures, see the Background section of the Specification. Ueda deals with abrasive particles, see col. 1, lines 7-11, and has absolutely nothing to do with thermal barrier coatings or similar structures. Ueda never mentions thermal barrier coatings or anything remotely similar. Ueda is therefore is not properly within the scope of the prior art. A person seeking to improve thermal barrier coatings would have no motivation to extract any abrasive teachings from Ueda and attempt to apply them to the technology of thermal barrier coatings. It is therefore not properly applied in rejecting the present claims.

But, if Ueda is applied in forming the rejection, the combination of teachings still does not teach the present claim limitations.

Claim 6 depends from claim 1 and incorporates its limitation. The combination of the first three references does not teach the limitations of claim 1 for the reasons stated above

-11-

in relation to the Ground 2 rejection, and Ueda adds nothing in this regard. The combination of the four references does not teach the limitations of claim 6.

Claim 11 depends from claim 9 and incorporates its limitation. The combination of the first three references does not teach the limitations of claim 9 for the reasons stated above in relation to the Ground 2 rejection, and Ueda adds nothing in this regard. The combination of the four references does not teach the limitations of claim 11.

Applicant asks the Examiner withdraw the rejections and allow the application to issue.

-12-

**CONCLUSION**

For at least the reasons set forth above, Applicant respectfully requests reconsideration of the Application and withdrawal of all outstanding rejections. Applicant respectfully submits that the claims are not anticipated by, nor rendered obvious in view of; the cited art either alone or in combination and thus, are in condition for allowance. Thus, Applicant requests allowance of all pending claims in a timely manner.

This Response has been filed within three (3) months of the mailing date of the Office Action and it is believed that no fees are due with the filing of this paper except for \$200 for a single additional independent claim in excess of three. The Commissioner is hereby authorized to deduct this and any other fees determined by the Patent Office to be due from the undersigned's Deposit Account No. 50-1059.

Dated: December 11, 2006

Respectfully submitted,  
McNees Wallace & Nurick LLC

Phone: (717) 237-5218  
Fax: (717) 237-5300

/Shawn K Leppo/  
Shawn K. Leppo  
Reg. No. 50,311  
100 Pine Street  
P.O. Box 1166  
Harrisburg, PA 17108-1166  
Attorney for Applicant